

1 CLAIMS

2 We Claim:

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- 4 1. A method for spreading the electromagnetic emissions
5 of a generated clock that is created in response to a
6 reference clock signal, the method comprising the steps of:
7 providing an adjustable delay line having a
8 plurality of selectable delay trim units in the path of
9 the reference clock signal;
10 enabling a first set of delay trim units in the
11 adjustable delay line during a first clock period,
12 thereby causing the generated clock signal to exhibit a
13 first clock period;
14 enabling a second set of delay trim units in the
15 adjustable delay line during a second clock period,
16 thereby causing the generated clock signal to exhibit a
17 second clock period, wherein the second clock period is
18 less than the first clock period; and
19 enabling a third set of delay trim units in the
20 adjustable delay line during a third clock period,
21 thereby causing the generated clock signal to exhibit a
22 third clock period, wherein the third clock period is
23 greater than the first clock period.
- 24
- 25 2. The method of Claim 1, further comprising the steps
26 of:
27 enabling a fourth set of delay trim units in the
28 adjustable delay line during a fourth clock period,
29 thereby causing the generated clock signal to exhibit a
30 fourth clock period, wherein the fourth clock period is
31 less than the second clock period; and
32 enabling a fifth set of delay trim units in the
33 adjustable delay line during a fifth clock period,
34 thereby causing the generated clock signal to exhibit a
35 fifth clock period, wherein the fifth clock period is
36 greater than the third clock period.

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2 3. The method of Claim 1, wherein a difference between
3 the first clock period and the second clock period is about
4 50 picoseconds or more.

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6 4. The method of Claim 3, wherein a difference between
7 the first clock period and the third clock period is about 50
8 picoseconds or more.

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10 5. The method of Claim 1, further comprising the step
11 of adjusting the delay trim units in the adjustable delay
12 line in a predetermined pattern.

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14 6. The method of Claim 1, further comprising the step
15 of generating an overflow signal if the delay trim units
16 enabled in the adjustable delay line reach a predetermined
17 level.

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19 7. A method for spreading the electromagnetic emissions
20 of a generated clock that is created in response to a
21 reference clock signal, the method comprising the steps of:

22 providing an adjustable delay line having a
23 plurality of selectable delay trim units in the path of
24 the reference clock signal;

25 generating a first control signal for enabling a
26 first set of delay trim units in the adjustable delay
27 line, the first set of delay trim units being selected
28 to provide a generated clock signal having a base clock
29 period;

30 generating a second control signal for adjusting
31 the first set of delay trim units, the second control
32 signal being selected to vary in a predetermined
33 pattern;

34 combining the first control signal and the second
35 control signal to create a third control signal;

1 providing the third control signal to the
2 adjustable delay line, wherein the third control signal
3 causes different sets of delay trim units to be enabled
4 during different cycles of the reference clock signal,
5 thereby causing the generated clock signal to exhibit a
6 pattern of varying clock periods, wherein the pattern of
7 clock periods includes the base clock period, as well as
8 clock periods greater than and less than the base clock
9 period.

10 8. A method for spreading the electromagnetic emissions
11 of a generated clock signal that is created in response to a
12 reference clock signal, the method comprising the steps of:

13 providing a delay line in the path of the reference
14 clock signal; and

15 adjusting the trim units in the delay line in a
16 pre-determined pattern during consecutive clock cycles.

17 9. The method of Claim 8, further comprising the step
18 of providing an offset in the reference clock signal prior to
19 the step of adjusting.

20 10. The method of Claim 9, wherein the step of
21 providing an offset comprises providing a trim unit
22 adjustment of +2 prior to starting the pattern and wherein
23 the pattern comprises providing trim unit adjustments of +1,
24 +2, 0, +2, -1, +2, -2, +2 and +2 during nine consecutive
25 clock cycles.

26 11. The method of Claim 8, wherein the pattern
27 comprises providing trim unit adjustments of -1, 0, -2, 0,
28 -3, 0, -4, 0 and 0 during nine consecutive clock cycles.

29 12. The method of Claim 8, wherein the pattern
30 comprises providing trim unit adjustments of -1, 0 and 0
31 during three consecutive clock cycles.

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2 13. The method of Claim 8, wherein the pattern
3 comprises providing trim unit adjustments of -1, 0, -2, 0 and
4 0 during five consecutive clock cycles.

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6 14. The method of Claim 9, wherein the step of
7 providing an offset comprises providing a trim unit
8 adjustment of +1 prior to starting the pattern, and wherein
9 the pattern comprises providing trim unit adjustments of 0,
10 +1, -1, +1 and +1 during five consecutive clock cycles.

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12 15. The method of Claim 8, wherein the pattern
13 comprises providing trim unit adjustments of -1, 0, -2, 0,
14 -3, 0 and 0 during seven consecutive clock cycles.

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16 16. The method of Claim 9, wherein the step of
17 providing an offset comprises providing a trim unit
18 adjustment of +1 prior to starting the pattern, wherein the
19 pattern comprises providing trim unit adjustments of 0, +1, -
20 1, +1, -2, +1 and +1 during seven consecutive clock cycles.

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23 17. The method of Claim 8, wherein the clock signal
24 exhibits different frequencies during successive cycles, the
25 energy of the clock signal being spread equally over the
26 different frequencies.

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28 18. The method of Claim 9, wherein the offset is
29 selected to minimize the worst-case skew introduced between
30 the reference clock signal and the generated clock signal.

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